**MATHEMATICS STAGE 3**

**TEACHING AND LEARNING OVERVIEW**

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| TERM: | WEEK: 16 | STRAND: Number and Algebra | **SUB-STRAND:** Multiplication and Division 2 | **WORKING MATHEMATICALLY:**  MA3-1WM |
| OUTCOMES: MA3-6NA | | **Selects and applies appropriate strategies for multiplication and division, and applies the order of operations to calculations involving more than one operation.** | | |
| **CONTENT:** | | **Explore the use of brackets and the order of operations to write number sentences.**   * recognise that the grouping symbols ( ) and [ ] are used in number sentences to indicate operations that must be performed first. * recognise that if more than one pair of grouping symbols are used, the operation within the innermost grouping symbols is performed first. * perform calculations involving grouping symbols without the use of digital technologies. | | |
| ASSESSMENT FOR LEARNING (PRE-ASSESSMENT) | | Drill with simple algorithms where students choose the appropriate operation sign to insert.  Eg. 3 ☐ 4 = 12 or ( 5 ☐ 4) + 4 = 24 | | |
| WARM UP / DRILL | | Various number fact drills as follows:   * Shoot out – multiplication and division facts. * Multiplication and division speed tests. * Using interactive 100s chart on IWB, have students time how long it takes to list the factors/multiples of various numbers. | | |
| TENS ACTIVITYNEWMAN’S PROBLEMINVESTIGATION | | Judith bought: 4 canvases @ $2.75 each, 3 paintbrushes @ $2.00 each and 2 paints @ $5.10 each. How much change did she have left from $30.  $30 –[ (4 X $2.75) + (3 X $2.00) + (2 X $5.10)] | | |
| QUALITY TEACHING ELEMENTS | | **INTELLECTUAL QUALITY** | **QUALITY LEARNING ENVIRONMENT** | **SIGNIFICANCE** |
| * Deep knowledge * Deep understanding * Problematic knowledge * Higher-order thinking * Metalanguage * Substantive communication | * Explicit quality criteria * Engagement * High expectations * Social support * Students’ self-regulation * Student direction | * Background knowledge * Cultural knowledge * Knowledge integration * Inclusivity * Connectedness * Narrative |
| RESOURCES | | Interactive 100s Chart on IWB, Order of operations pre-test created on <http://worksheets.theteacherscorner.net/make-your-own/math-worksheets/algebra/order-of-operations-worksheet.php> , BIMDAS ppt <http://www.google.com.au/url?sa=t&rct=j&q=&esrc=s&source=web&cd=3&ved=0CEEQFjAC&url=http%3A%2F%2Fbshs-maths.wikispaces.com%2Ffile%2Fview%2FBIMDAS.ppt&ei=kDd3U5zSKMzokAX50oDwDg&usg=AFQjCNFUnhrLFnEa4nCsK7hoBQt8hdN0uQ&sig2=gmLQ7Tq-CJQcoHINmfQdtQ&bvm=bv.66917471,d.dGI> | | |

**TEACHING AND LEARNING EXPERIENCES**

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| WHOLE CLASS INSTRUCTION MODELLED ACTIVITIES | GUIDED & INDEPENDENT ACTIVITIES | |
| ☐ Revise the term- operation as it pertains to addition, subtraction, multiplication and division. Ensure students understand the terms multiples, factors and indices. ☐ **Revise** the acronym BIMDAS- **Brackets, Indices, Multiplication, Division, Addition, Subtraction.**  ☐ **Explicitly teach-** that any operation within brackets needs to be solved first. Then division, multiplication from left to right followed by addition and subtraction also from left to right.  ☐ Explicitly teach the process for solving an algorithm that contains multiple sets of brackets, including brackets inside brackets. | LEARNING SEQUENCERemediationS2 or Early S3 | Revise number facts and basic algorithms incorporating the different operations.  Introduce BIMDAS and show how this pertains to more complex algorithms. Give some to show just including addition and subtraction. Then provide examples with multiplication and division. Explain how these are solved from left to right.  Provide a worksheet with examples to solve.  Revise Factors. |
| LEARNING SEQUENCES3 | ☐ Online interactive order of operations ‘who wants to be a millionaire’ game. <http://www.math-play.com/Order-of-Operations-Millionaire/order-of-operations-millionaire.html>  ☐ Worksheet: Students to complete worksheet that contains more complex questions that involve working with brackets and also indices. Eg. 5 x ( 3 + 22)=  ☐ iPad Game ‘OOOPS: The order of operations game. Students play iPad game that gets them to insert brackets in the correct place for the equation to make sense.  Eg. 1 + 2 + 2 x 2 + 3 = 11  ☐**Investigation**: Have students develop their own problems that relate to the real world that contains multiple set of brackets. Eg. Judith bought: 4 canvases @ $2.75 each, 3 paintbrushes @ $2.00 each and 2 paints @ $5.10 each. How much change did she have left from $30.  $30 –[ (4 X $2.75) + (3 X $2.00) + (2 X $5.10)]  ☐ Assessment: Quiz with various algorithms and problems relating to order of operations. |
| LEARNING SEQUENCEExtensionEarly S4 | ☐ **5 Dice order of operations game on iPad.** Have students play 5 Dice order of operations game in pairs or small groups. Game is pitched at different ability levels so have more capable students work through harder questions. The harder questions will include the use of integers. |
| **EVALUATION & REFLECTION** | **Student engagement Achievement of outcomes**  **Resources Follow up** |

* All assessment tasks should be written in **red** and planning should be based around developing the skills to complete that task.
* Assessment rubrics or marking scale should be considered.